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MS APPEAL BRIEF - PATENTS
Docket No.: 3273-0121P
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Yasutaka ISHII et al.

Application No.: 09/622,001

Confirmation No.: 5966

Filed: September 22, 2000

Art Unit: 1626

For: PROCESS FOR PRODUCING ORGANIC
COMPOUNDS USING CATALYTIC IMIDE
COMPOUNDS

Examiner: T. A. Solola

APPEAL BRIEF TRANSMITTAL FORM

MS Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

June 6, 2005

Sir:

Transmitted herewith is an Appeal Brief on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on April 6, 2005.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27.

The fee has been calculated as shown below:

☐ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - \$0.00.

☒ Fee for filing an Appeal Brief - \$500.00 (large entity).

☒ An Appeal Brief and \$320.00 fee therefor, was filed herein on June 3, 2003. Thus, a fee of \$180.00 is required for filing this Appeal Brief. Check(s) in the amount of \$180.00 is(are) attached.

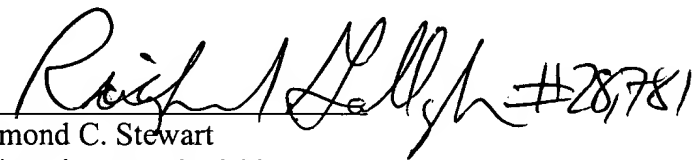
☐ Please charge Deposit Account No. 02-2448 in the amount of \$0.00. A triplicate copy of this sheet is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: June 6, 2005

Respectfully submitted,

By

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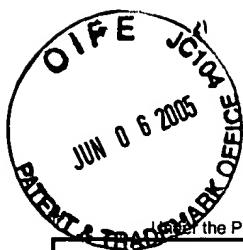
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Attachment(s)



Under the Paperwork Reduction Act of 1995, no person are required to respond to a collection of information unless it displays a valid OMB control number.

Effective on 12/08/2004. Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).		Complete if Known	
FEE TRANSMITTAL For FY 2005		Application Number	09/622,001
		Filing Date	September 22, 2000
		First Named Inventor	Yasutaka ISHII
		Examiner Name	T. A. Solola
		Art Unit	1626
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27		Attorney Docket No.	3273-0121P
TOTAL AMOUNT OF PAYMENT		(\$)	180.00

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☐ Deposit Account Deposit Account Number: 02-2448 Deposit Account Name: Birch, Stewart, Kolasch & Birch, LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)** **Multiple Dependent Claims**

_____ - 20 = _____ x _____ = _____ **Fee (\$)** **Fee Paid (\$)**

Indep. Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)**

_____ - 3 = _____ x _____ = _____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
_____	_____	_____ / 50 (round up to a whole number) x _____	_____	_____

4. OTHER FEE(S)

	Fees Paid (\$)
Non-English Specification, \$130 fee (no small entity discount)	
Other (e.g., late filing surcharge): <u>1402 Filing a brief in support of an appeal</u>	<u>180.00</u>

SUBMITTED BY			
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		Date	June 6, 2005



PATENT
3273-0121P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Before the Board of Appeals

Yasutaka ISHII et al. Appeal No.:

Appl. No.: 09/622,001 Group: 1626

Filed: September 22, 2000 Examiner: SOLOLA

Conf. No.: 5966

For: PROCESS FOR PRODUCING ORGANIC COMPOUNDS USING
 CATALYTIC IMIDE COMPOUNDS

APPEAL BRIEF



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CATALYTIC IMIDE COMPOUNDS

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PATENT
3273-0121P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re application of

Yasutaka ISHII, et al.

Appeal No.:

Appl. No.: 09/622,001

Group: 1626

Filed: September 22, 2000

Examiner: SOLOLA

Conf. No.: 5966

For: PROCESS FOR PRODUCING ORGANIC COMPOUNDS USING CATALYTIC
IMIDE COMPOUNDS

BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

June 6, 2005

Sir:

This is an appeal from the December 6, 2004 Final Rejection
of claims 1, 3, 21, 23, and 24.

(i.) Real party in interest.

The real party in interest in this appeal is Daicel Chemical
Industries, Ltd., of Osaka, Japan. Daicel is the Assignee of the
present application.

(ii.) Related appeals and interferences.

There are no related appeals or interferences.

(iii.) Status of claims.

Claims 23 and 24 are indicated to be allowable. Claims 4-13 and 22 have been cancelled. Claims 2 and 14-20 stand withdrawn from consideration. Claims 1, 3, and 21 are rejected.

(iv.) Status of Amendments.

On March 7, 2005, Applicants proposed an Amendment under 37 CFR 1.116. In an Advisory Action mailed March 31, 2005, the Examiner kindly agreed to enter that Amendment. In the Advisory Action, the Examiner kindly indicated that claims 23 and 24 would be allowable if rewritten in independent form.

(v.) Summary of claimed subject matter.

The present invention provides a process for producing an organic compound which is an *addition* reaction product of a compound (A) and a compound (B) or an oxidized product thereof, or which is a *substitution* reaction product of a compound (A) and a compound (B) or an oxidized product thereof, all under mild conditions. Specification, page 6, 8th-10th lines. In accordance with the present invention, these reactions are carried out in the presence of molecular oxygen and a specified catalytic imide compound. Specification, page 9, 1st-8th lines. Compounds produced in accordance with the present invention can markedly improve definition and developing efficiency in photoresist

resins. Specification, page 9, penultimate line - page 10, 2nd line.

Compounds (A) may be (A1) oxygen-atom-containing compounds each having a carbon-hydrogen bond at the adjacent position to an oxygen atom, (A2) carbonyl-group-containing compounds, or (A3) compounds each having a hydrocarbon group with a methine carbon atom. Compounds (B) may be (B1) unsaturated compounds or (B2) compounds each having a hydrocarbon group with a methine carbon atoms, provided however that if a 1,2-dicarbonyl compound or its hydroxy reductant is used as the compound (A), the compound (B) is a radical scavenging compound (B1). Specification, page 10, 3rd-to-last line through page 11, 11th line.

The significance of the present invention resides in its provision of a **class** of imide catalysts that can be used in a **class** of reactions to produce **classes** of compounds. Applicants' invention relates to the use of a particular **class** of imide compounds to catalyze a **class** of reactions.

Specifically, the invention relates to a process of allowing two compounds to react with each other in the presence of a specific imide compound and a radical generator with respect to the imide compound to yield a product of an addition or substitution reaction or an oxidized product thereof by a radical mechanism.

Specification, page 1, 7th-12th lines.

Although Applicants have provided voluminous generic disclosure and 38 working Examples relating to a wide variety of representative compounds (specification, page 107, 10th line -

page 136, last line), Applicants do not consider that their invention is limited by the details of the production of each individual compound that can be produced in accordance with their novel synthetic route.

(vi.) Grounds of rejection to be reviewed on appeal.

The rejections of claims 1, 3, and 21 under 35 U.S.C. §101 and under the first and second paragraphs of 35 U.S.C. §112 are to be reviewed in this appeal.

(vii.) Argument.

35 U.S.C. §112, second paragraph

Claims 1, 3, and 21 were rejected under the second paragraph of 35 U.S.C. §112 as failing to define the invention properly. Final Rejection of 12/06/2004, pages 6-8.

Claims 1, 3, and 21 were rejected for allegedly failing "to recite the specific reagents and product thereof". Nothing in the language of the statute requires the recitation of specific reagents or specific products in a process claim. On the contrary, the law is quite clear that the focus under the second paragraph of 35 U.S.C. §112 is on what applicants intend.

When the applicant states the meaning that the claim terms are intended to have, the claims are examined with that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art.

In re Zletz, 13 USPQ2d 1320, at 1322 (case cited by Examiner).

The *Fressola* case, also cited by the Examiner, does not contradict this view of the law. In *Fressola*, the claim in question was directed to a system for the display of stereographic three-dimensional images of celestial objects "as disclosed in the specification and drawings herein". The claims in the present application do not refer to the specification or to drawings.

A claim to a chemical compound is not indefinite merely because a structure is not presented or because a partial structure is presented. For example, the claim language at issue in *In re Fisher*, 166 USPQ 18, referred to a chemical compound as a "polypeptide of at least 24 amino acids having the following sequence". A rejection under the second paragraph of 35 U.S.C. §112 for failure to identify the entire structure was reversed and the court held: "While the absence of such a limitation obviously broadens the claim ..., it does not render the claim indefinite." Similarly, in *In re Skoll*, 187 USPQ 481, the court held that the broad language "organic and inorganic acids" was not indefinite, and that the functional language "water soluble hydrolyzed carbohydrate" was acceptable because it was adequately defined in the specification.

In *In re Mercier*, 185 USPQ 774, the language "a fluidized catalyst" was found not to be indefinite. The court reasoned that

if one can determine whether a particular catalytic process for splitting acetals and hemiacetals is or is not within the scope of a claim, the claim fulfills its purpose as a definition.

185 USPQ at 780. By analogy, in the present application, one can readily determine whether a particular catalytic process for producing an organic addition or substitution reaction product is within the scope of each and any of claims 1, 3, 21.

The Examiner has not demonstrated that any of claims 1, 3, or 21 fails to particularly point out or distinctly claim "the subject matter which the applicant regards as his invention". Accordingly, the Examiner has failed to state a sustainable rejection under the second paragraph of 35 U.S.C. §112.

35 U.S.C. §112, first paragraph - written description

Claims 1, 3, and 21 were rejected under the first paragraph of 35 U.S.C. §112, as fail to comply with the written description requirement. Final Rejection of 12/06/2004, pages 3-4.

In his statement of this ground of rejection, the Examiner indicates that "Applicant must show possession of the invention by describing it with all the claimed limitations". Query: Precisely which of the presently claimed limitations does the Examiner believe is not described in writing in the specification?

Claim 1 is disclosed in such places as e.g. pages 35-43 of the specification (compound A) and e.g. pages 43-46 (compound B).

Claim 3 is disclosed in such places as e.g. pages 13 and 68-75 of

the specification. Claim 21 is disclosed in such places as e.g. pages 31-34 of the specification.

The Examiner has failed to state a sustainable rejection under the written description requirement of the first paragraph of 35 U.S.C. §112.

35 U.S.C. §112, first paragraph - enablement

Claims 1, 3, and 21 were rejected under the first paragraph of 35 U.S.C. §112, as fail to comply with the enablement requirement. Final Rejection of 12/06/2004, pages 4-6. Regarding the enablement rejection, the Examiner argues that "The claimed process is not believable on its face". Page 4, middle. The Examiner is respectfully requested to clarify that statement.

In his analysis, the Examiner quite properly refers to the decision of the CAFC in *In re Wands*. However, the Examiner's analysis of the eight *Wands* factors is flawed.

Wands factors 1. & 2. - the breadth of the claims and the nature of the invention. The Examiner alleges that "the claimed invention involves a process of making any organic compound". Actually, the claimed invention involves a process for making only those organic compound that are addition or substitution reaction products of a compound (A) and a compound (B) or an oxidized product thereof. The reactant compounds (A) and (B) are defined in the claims.

Wands factor 3. - the state of the prior art. The Examiner argues that "There is no known prior art claiming a process for making all organic compounds". That may be true. In any case, however, the present claims certainly do not claim a process for making **all** organic compounds. Regarding the state of the prior art relevant to the presently claimed addition and substitution reactions, relevant background art is discussed on pages 2-6 of the specification. The Examiner's attention is also directed to the Information Disclosure Statements filed herein.

Wands factor 4. - the level of ordinary skill in the art.
The Examiner indicates that

The level of ordinary skill in the art is limited to a process of making α -hydroxy- γ , γ -dimethyl- γ -butyrolactone as disclosed in the specification.

Does this mean that the level of skill in the art is not high for the presently claimed processes of making other compounds such as α -hydroxy- γ -butyrolactone and α -hydroxy- γ -ethyl- γ -propyl- γ -butyrolactone? The Examiner is respectfully requested to explain what he means by his statement with respect to level of ordinary skill in the art.

Wands factors 5. & 6. - the level of predictability in the art and the amount of direction and guidance provided by the inventor. The Examiner alleges that the level of "predictability is very low and ... the amount of direction

and guidance provided by applicant is limited to a process of making α -hydroxy- γ,γ -dimethyl- γ -butyrolactone comprising the reaction of 2-propanol with ethyl acrylate in the presence of N-hydroxyphthalimide". The Examiner fails to indicate how he decided that the level of predictability is "very low". The present claims define the two classes of reactants - that are being reacted with one another - functionally as well as with reference to their structural components, as follows:

(A) a compound capable of forming a stable radical and being selected from (A1) oxygen-atom-containing compounds each having a carbon-hydrogen bond at the adjacent position to an oxygen atom, (A2) carbonyl-group-containing compounds, and (A3) compounds each having a hydrocarbon group with a methine carbon atom

and

(B) a radical scavenging compound selected from (B1) unsaturated compounds, (B2) compounds each having a hydrocarbon group with a methine carbon atom, and (B3) heteroatom-containing compounds.

Accordingly, a high degree of predictability is inherent in the present invention. As for direction and guidance, the Examiner's attention is directed to **pages 24-107** of the specification, which provide **voluminous and detailed direction and guidance** as to how to practice the presently claimed invention.

Wands factor 7. - existence of working examples. The Examiner does not address Wands factor 7, the existence of

working examples. The present specification includes thirty-eight (38) **different fully documented working Examples (!)** illustrating the practice of a wide variety of embodiments of the present invention.

Wands factor 8. - the quantity of experimentation needed to make or use the invention based on the content of the disclosure. It is not any experimentation, but only "undue" experimentation, that is forbidden by the statute. The Examiner has the burden of establishing - not simply arguing - that undue experimentation would be necessary. In any case, the present invention does not lend itself to "undue experimentation" problems. To establish coverage under claims 1, 3, and 21, one simply allows a compound capable of forming a stable radical as defined in (A1)-(A3) to react with a radical scavenging compound as defined in (B1) and (B2) - in the presence of an imide compound of Formula (1) and, for claim 21, in the presence of a metallic co-catalyst - and then one determines whether an addition or substitution reaction product has formed. Where is the **undue** experimentation in this simple test? The Examiner is respectfully reminded of the facts of the *Wands* case and the conclusions of the Court in that case. In *Wands*, the success rate of the screening experiments was such that only 2.8% of the input hybridomas produced a useful

antibody. In some of the screens, no useful hybridomas were identified. The *Wands* panel concluded that, despite this low success rate, the invention was enabled. Do to the nature of the present invention, the "screening" described above would presumably have a success rate close to 100%.

Applicants respectfully contend that all of the claims presented in this application are fully enabled by the disclosure.

In the paragraph bridging pages 5-6 of the Office Action, the Examiner alleges that the above arguments "have been fully considered". Unfortunately however the Examiner fails to indicate in the Office Action why each of those arguments is not persuasive.

In the paragraph bridging pages 5-6 of the Office Action, the Examiner refers to Table R3 and indicates that "by adding the table to the specification and applicable structures to the claims the rejection would be overcome". Inasmuch as Table R3 is merely a compendium of the thirty-eight (38) working Examples herein, it has been, in effect, added to the specification. Does this remark by the Examiner mean to imply that only claims limited to the thirty-eight (38) working Examples can possibly be found to be enabled?

It is manifest that the Examiner has failed to satisfy his burden of proof with respect to the establishment of a sustainable

rejection based upon failure to satisfy the enablement requirement of the first paragraph of 35 U.S.C. §112.

35 U.S.C. §101

Claims 1, 3, and 21 were rejected under 35 U.S.C. §101 as lacking utility. Final Rejection of 12/06/2004, pages 2-3.

It is noted that in spite of his citation of judicial precedent in connection with other rejections made in the outstanding Office Action, the Examiner has not cited any decisions supporting this ground of rejection.

Applicants respectfully submit that the process of reacting a chemical compound (A) as defined in the present claims with a chemical compound (B) as defined in the present claims to produce a chemical compound product of the reaction is "useful" within the meaning of the statute.

In an Amendment that was filed on September 16, 2004, Applicants had supplied references D1-D5 as evidencing the utility of the presently claimed process invention. The Examiner is apparently disregarding that evidence on the ground that it was not included in the specification. However, it is axiomatic that the disclosure of a patent application is directed to persons skilled in the art. The specification of a patent application need not - indeed, should not - provide information that is already within the expected skill of the art.

Manifestly, the Examiner has failed to state a sustainable rejection under 35 U.S.C. §101.

FIELD OF SEARCH IRRELEVANT. In the Final Rejection of 12/04/2002, the Examiner had indicated that chemical processes are classified by the PTO based upon the products which they produce, and that the present claims would therefore fall within a large number of different subclasses. In the Advisory Action of 03/17/2003, the Examiner had alleged that "the claims are not clear and distinct and therefore not classifiable or searchable".

As Applicants pointed out in their Brief on Appeal filed June 3, 2003, the statute does not require that applicants define their invention in terms of the PTO classification system, but only that applicants particularly point out and distinctly claim what they regard as their invention. In this case, Applicants' invention relates to the use of a particular class of imide compounds to catalyze a class of reactions. Specification, page 1. Since all of the processes of the present invention require the utilization of specified imide catalysts, searches for relevant prior art should presumably include a search keyed to those imide compounds.

In any case, it is respectfully submitted that the search considerations expressed by the Examiner during the extensive prosecution of this application to date are irrelevant to considerations of compliance with 35 U.S.C. §§ 101 and 112.

Conclusion

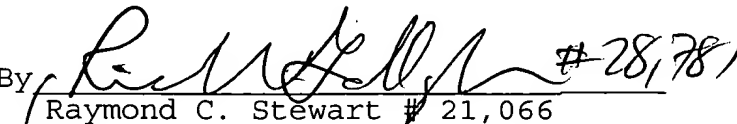
Claims 1, 3, and 21 herein clearly define aspects of a single useful (35 U.S.C. §101) invention in the manner prescribed by the second paragraph of 35 U.S.C. §112, and the invention of each of said claims is enabled by and described in writing in the specification as required by the first paragraph of 35 U.S.C. §112. Accordingly, none of the rejections of record should be sustained.

For any questions concerning this application, please contact Richard Gallagher, Reg. No. 28,781, at (703) 205-8008.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By  #28,781
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(viii.) Claims appendix. The claims involved in this appeal are claims 1, 3, and 21:

1. A process for producing an organic compound which is an addition or substitution reaction product of a compound (A) and a compound (B) or an oxidized product thereof, wherein said product is selected from the group consisting of

(i-1) an addition reaction product or an oxidized product thereof, where an adjacent position to an oxygen atom of a compound (A1) is bonded to a carbon atom of an unsaturated bond of an unsaturated compound (B1) when an oxygen-atom-containing compound (A1) is employed as a compound (A),

(i-2) a substitution reaction product or an oxidized product thereof, where an adjacent position to an oxygen atom of a compound (A1) is bonded to a methine carbon atom of a compound (B2) having a hydrocarbon group with a methine carbon atom when an oxygen-atom-containing compound (A1) is employed as a compound (A),

(ii-1) an addition reaction product or an oxidized product thereof, where a bond between a carbonyl group and an atom adjacent to a carbonyl group of a compound (A2) is broken, and a group containing the a carbonyl group is bonded to the aforementioned position of a compound (B1) when a carbonyl-group-containing compound (A2) is employed as a compound (A),

(ii-2) a substitution reaction product or an oxidized product thereof, where a bond between a carbonyl group and an atom adjacent to a carbonyl group of a compound (A2) is broken, and a group containing the a carbonyl group is bonded to the aforementioned position of a compound (B2) when a carbonyl-group-containing compound (A2) is employed as a compound (A),

(iii-1) an addition reaction product or an oxidized product thereof, where a methine carbon atom of a compound (A3) is bonded to the aforementioned position of a compound (B1) when a compound (A3) containing a hydrocarbon group with a methine carbon atom is employed as a compound A, and

(iii-2) a substitution reaction product or an oxidized product thereof, where a methine carbon atom of a compound (A3) is bonded to the aforementioned position of a compound (B2) when a compound (A3) containing a hydrocarbon group with a methine carbon atom is employed as a compound A,

said process comprising the step of allowing (A) a compound capable of forming a stable radical and being selected from

(A1) oxygen-atom-containing compounds each having a carbon-hydrogen bond at the adjacent position to an oxygen atom,

(A2) carbonyl-group-containing compounds, and

(A3) compounds each having a hydrocarbon group with a methine carbon atom

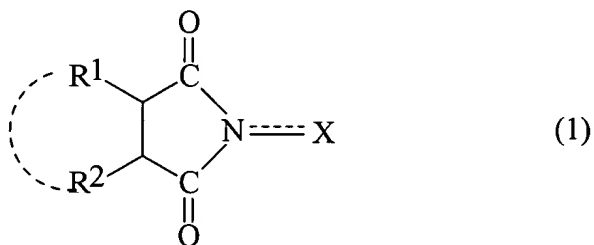
to react with (B) a radical scavenging compound selected from

(B1) unsaturated compounds, and

(B2) compounds each having a hydrocarbon group with a methine carbon atom,

provided that if a 1,2-dicarbonyl compound or its hydroxy reductant is used as the compound (A), the compound (B) is a radical scavenging compound (B1)

in the presence of a catalytic imide compound and in the presence of molecular oxygen, by catalysis of the imide compound, wherein the imide compound is shown by the following formula (1):



wherein each of R¹ and R² is, identical to or different from each other, a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a cycloalkyl group, a hydroxyl group, an alkoxy group, a carboxyl group, an alkoxycarbonyl group, or an acyl group, where R¹ and R² may be combined to form a double bond, or an aromatic or non-aromatic ring; X is an oxygen atom or a hydroxyl group; and one or two N-substituted cyclic imido groups indicated in the formula (1) may be further bonded to said R¹, R², or to the double bond or

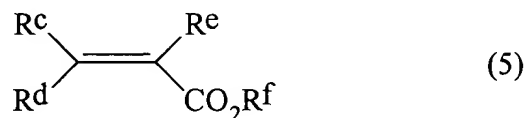
aromatic or non-aromatic ring formed together by R¹ and R²,
to yield a product of an addition or substitution reaction of said
compound (A) and said compound (B) or an oxidized product thereof.

3. The process for producing an organic compound according
to claim 1, which process comprises an addition reaction wherein
compound (A) is (A11) an alcohol shown by the following
formula (2):



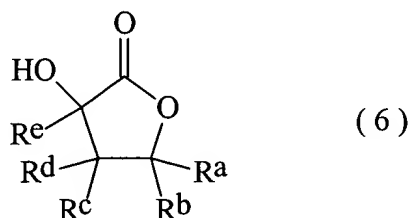
wherein each of R^a and R^b is, identical to or different from
each other, a hydrogen atom or an organic group, where R^a and
R^b may be combined to form a ring with the adjacent carbon
atom,
and

compound (B) is (B12) an α,β -unsaturated carboxylic acid
derivative shown by the following formula (5):



wherein each of R^c, R^d, R^e, and R^f is, identical to or
different from one another, a hydrogen atom or an organic

group, where R^c , R^d , and R^e may be combined to form a ring with the adjacent carbon atom or carbon-carbon bond, and wherein the organic compound which is an addition or substitution reaction product or an oxidized product thereof is an α -hydroxy- γ -butyrolactone derivative shown by the following formula (6):



wherein R^a , R^b , R^c , R^d , and R^e have the same meanings as defined above.

21. A process according to one of claims 1 to 3 and 14 to 20, wherein a metallic compound is used as a co-catalyst.

(ix.) Evidence appendix. N. A.

(x.) Related proceedings appendix. N. A.